

1968

Criminal Law Comments and Case Notes

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Recommended Citation

Criminal Law Comments and Case Notes, 59 J. Crim. L. Criminology & Police Sci. 57 (1968)

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CRIMINAL LAW COMMENTS AND CASE NOTES

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SCIENTIFIC EVIDENCE IN TRAFFIC CASES

ROBERT GREENWALD

Speed and drinking are the two most influential factors contributing to deaths on the highways. In 1966, over 50,000 persons in the United States lost their lives as a result of traffic accidents.¹ Of the fatal accidents which occurred, speed was a contributing factor in 35% of the cases.² Suggestions have been made that alcohol is causally related to approximately 50% of fatal accidents in the United States.³

Even such conservative estimates⁴ as those quoted above, indicate the necessity for prosecuting speeding and drinking motorists before they cause harm to themselves or others. Successful prosecution may well depend on the means for determining when an offense is committed. Scientific research has provided these means.

VEHICULAR SPEED

Several scientific methods have been developed to determine the speed of a moving vehicle. The photo-traffic camera is a device which "takes two photos, at a set time interval apart, of a moving vehicle. The distance traveled, by the car, in that interval, from a fixed point, is the basis for a mathematical computation of the rate of speed."⁵ The Prather speed device, or electric timer, "consists of a control panel which contains a stop watch, a switch, and a reset button. In addition, there is a cable 500 feet long that plugs into the box. There are two rubber tubes which stretch the width of the street."⁶ They are activated by the wheels of passing cars so that the time the car takes to pass from one to the other of the hoses is measured by the stop watch. The speed is then mathematically computed.

The most common speed detection device used by law enforcement agencies is the radar speedmeter.⁷ It has been described as follows:

⁵ *People v. Hildebrandt*, 308 N.Y. 397, 398, 126 N.E.2d 377, 378 (1955). Defendant found not guilty because he was not identified as driver of car by photos taken. *Cf. People v. Pett*, 13 Misc.2d 975, 178 N.Y. S.2d 550 (Police J. Ct. 1958).

⁶ *Carrier v. Commonwealth*, 242 S.W.2d 633, 634 (Ky. 1951).

⁷ Radar speedmeter is now used in forty-eight states and the District of Columbia. There are about 700 speed detection sets in operation.

¹ NADAR, *UNSAFE AT ANY SPEED* vii (1965).

² 59 *TRAFFIC SAFETY* 25-27 (No. 6, Dec. 1961).
³ Borkenstein and Crowther, *TRAFFIC DIGEST* AND *REV.* 12(6):4 (1964).

⁴ Ehrman, *Causes of Highway Accidents, The United States Experience*, 12-1 *TRAFFIC QUARTERLY* 35-36 (Jan. 1958) relates reports from twenty-one states in 1955 which established that (1) three out of ten drivers were violating a speed law; (2) half of these drivers were exceeding stated speed limits; (3) half were exceeding safe speed limits. DONIGAN, *CHEMICAL TESTS AND THE LAW* 1 (1966) discusses a survey in nineteen California counties establishing that of 1,134 drivers killed in motor vehicle accidents, about 55% had been drinking prior to their accident. In all car accidents, 69% had been drinking.

[i]n a rather simplified language, here is how the radar speedometer—"the little black box" as it has been called—works: behind the front panel of the speedometer are two antennas; one of these sends out a cone-shaped stream of radar waves at a certain frequency in the direction the speedometer is pointed. When a moving vehicle runs through these waves, they bounce back from it at a different frequency from which they were sent out,⁸ and the change in frequency varies directly with the speed of the moving object off which they reflect. The second antenna catches the reflected waves and their frequency is compared with that of the waves sent out. The difference in frequency is simplified and translated into miles per hour on a speedometer dial which is part of the speedometer.⁹ The speed of moving vehicles is recorded on a graph hooked up to the speedometer. Usually the speedometer is placed on the fender or in the open trunk of a police car called the "radar car" which is parked alongside the road; the closer it is to the road, the more accurate it will be. Down the road in one or

⁸ Doppler effect: "In sound, this effect is observed every day; where a train is approaching or going away from an observer, he will hear an apparent frequency difference in its bell or whistle from the frequency he would hear if both he and the train were at a standstill. An automobile horn would give the same effect, if the source of vibration is coming toward the observer, the frequency will be higher; going away from him, the frequency will be lower." Note, *Radar Traffic Controls*, 23 TENN. L. REV. 784, 785-786 (1955).

⁹ The basic formula for measurement as stated by Dr. John M. Kopper in his article, *The Scientific Reliability of Radar Speedmeters*, 33 N. C. L. REV. 343 (1955) is as follows:

$$\frac{v}{V} = \frac{1}{2} \frac{FD}{F} \quad \text{or} \quad v = \frac{1}{2} \frac{FD}{F} V$$

where v = velocity of the moving vehicle in miles per hour.

V = velocity of electromagnetic waves in space in miles per hour = 186,281 miles per second times 3600, the number of seconds in an hour. This figure is constant.

FD = beat frequency, measured by the speedometer.

F = frequency of oscillation of the radio waves from the meter, 2,455,000,000 cycles per second. This is the frequency of the radio waves transmitted from the speedometer. This frequency is hard to keep precisely constant. Dr. Kopper states that this frequency is maintained to within 0.1% of 2,455,000,000 cycles per second, and that this variation is the reason for the margin of error of the speedometer being two miles per hour.

both directions from the radar car will be one or two other police cars known as "pickup cars". These cars and the radar car communicate back and forth by radio. When a speed violator passes the radar car, the radar operator or another police officer in the radar car radios the pickup car down the road, and this latter car apprehends the speeder.¹⁰

BLOOD ALCOHOL TESTS

Four general methods have been developed by scientists to measure alcoholic concentration in the blood. They are chemical analyses of the four bodily substances: blood, urine, saliva, and breath.¹¹ Science has discovered that determination of the blood alcohol concentration will show the influence of alcohol on the person's driving ability. This result is a consequence of medical research which "has established that it is not the amount of alcohol consumed by a person which affects driving ability but the amount of alcohol absorbed into the blood and thus circulated through the body which affects the brain and other nerve centers and, correspondingly, the mental and or physical faculties."¹²

Several tests¹³ are commonly in use to analyze the bodily fluids—blood, saliva, and urine—for alcohol. All three bodily fluids can undergo the identical chemical test with the only requirement being that the urine and saliva tests be correlated to the blood alcohol concentration. The chemical tests employed have several common characteristics: "all employ distillation for separation of the ethyl alcohol from the specimen; the alcohol in the distillate is quantitated in each by oxidation, using potassium dichromate in sulfuric acid solution below the critical concentration of 20 N, the oxidation, in fact, being carried out at less than 18 N acidity."¹⁴ Under these conditions, ethyl alcohol in

¹⁰ Note, *Black Magic to Catch Speeders*, 9 Wyo. L. J. 122 (1945).

¹¹ See Rabinowitch, *Chemical Tests of Alcoholic Intoxication*, 29(2) ORBITER DICTA 15 (1955) for discussion of extent to which these analyses reflect the percentage of alcohol in blood. Note discussion on saliva, at 40-41, and why rarely used as substance to be analyzed.

¹² DONIGAN, *supra* n.4 at 59. See also Rabinowitch, *supra* n.11 at 23-25, on correlation between brain and blood alcohol.

¹³ The tests go by the name of the scientists who developed them: Heise, Nicloux, Harger, Widmark, Dubowski, Friedemann, and Brooke tests.

¹⁴ The normality, usually designated by a capital N, is the number of gram-equivalents of solute per liter of solution. The label 18 N represents a solution which contains eighteen gram-equivalents of potassium dichromate per liter of solution.

the distillate is quantitatively oxidized to acetic acid and volatile impurities exert minimal interference."¹⁵

To determine the amount of alcohol in breath, six different types of portable laboratories are in common use: the drunkometer, the drunkotester, the alcometer, the alcotester, the intoximeter, and the breathalyzer. "The breathalyzer is probably the best of the breath methods¹⁶ for determining blood alcohol in that the measuring device for determining the volume of air tested is very well engineered and appears to be quite accurate".¹⁷ It is also the simplest. The subject blows into the mouthpiece of the device while in the "TAKE" position.¹⁸ The last portion of the breath coming from deep in the lungs is collected in a cylinder. A stainless steel piston then lowers itself to cover a definite volume of breath. This sample is delivered for analysis by placing the valve in the "ANALYZE" position.¹⁹ The piston then lowers, forcing the collected breath "into an ampoule containing 3 ml. of 0.025% potassium dichromate and 0.025% silver nitrate in 50% by volume of sulfuric acid. In this solution, the alcohol is quantitatively oxidized to acetic acid with a corresponding reduction of dichromate. . . . This reduction is accompanied by a loss of yellow color measured by two photoelectric cells originally balanced at zero. At the same time a pointer moves on the face of the breathalyzer giving the blood alcohol concentration."²⁰

¹⁵ MANUAL, CHEMICAL TESTS FOR INTOXICATION, 34-35 (1959):

"The differences between the methods are in (a) the method of distillation, whether by direct distillation of distillation of a deproteinized filtrate; (b) the choice of protein precipitants; (c) the size, type and construction of the distillation apparatus; (d) the sulfuric acid concentration (ranging from about 17 N to 2 N) and the potassium dichromate concentration used during the oxidation, with consequent differences in the range of alcohol concentration of the several methods; and (e) the measurement of changes in the oxidizing reagent, whether by visual colorimetry, spectrophotometry, or titrimetry. The last represents the most important difference between these methods."

See *id.* at 34-41, for detailed description of apparatus, reagents, and procedures employed in each test.

¹⁶ See Rabinowitch, *supra* n.11 at 42-51, for reasons why breath tests, like saliva tests, should not be used.

¹⁷ ERWIN, THE DEFENSE OF DRUNK DRIVING CASES 28 (1963). For a detailed discussion of the breathalyzer, see Coldwell and Grant, *The Breathalyzer and Factors Affecting Its Accuracy*, 8 J. For. Sci. 149-162 (1963).

¹⁸ See Taylor, *Determining the Competence of a Breathalyzer Operator*, 9 CAN. B. J. 299, 300-301 (1966).

¹⁹ *Id.*

²⁰ *Id.* at 301. For diagrams, operational procedures, and chemicals used in all six methods, see MANUAL, *supra* n.15 at 45-53.

THE TESTING ENVIRONMENT

Basic problems arise in the practical application of any scientific device or test. The principles of the radar speedmeter or the breathalyzer may be sound, and yet the practical on-the-spot operation of these devices may fail to account for all relevant factors. The legal effectiveness of these scientific methods must depend on how carefully their scientific principles are modified to accommodate the real world.

The photo-traffic camera, for example, has been shown to have very little value in a court of law. The device fails to identify the driver of the automobile. The legal effectiveness of the instrument was illustrated in a case where the speed determination was not disputed, but the defendant could not be identified as the driver. The defendant's conviction was reversed on appeal.²¹

The increasing use of the radar speedmeter raises similar questions as to practicality of operation, accuracy, and reliability. The scientific principle seems to be generally accepted as sound,²² and yet "the problem is to measure the speed of a vehicle moving with respect to a stationary observer."²³ The operator must, therefore, note all factors possibly affecting the radar speedmeter reading at the time the measurement is being taken.

Such factors include not allowing the device a ten minute warm-up period, or, allowing the pointer of the meter to be above zero before measurements are taken. The effect of both is additive and should be noted. "Diathermy apparatus in the vicinity can give false readings, which would be noticed by sudden jumps to, say, seven miles per hour at the switching on of the diathermy machine, and sudden drops back to zero at switching off."²⁴ Even the movement of birds, trees, and signs can effect the reading on the radar speedmeter. Their effect is minimal, but "their frequency corresponds to that of the moving target, it cannot be filtered out without removing the desired target signal also."²⁵ The age of the radar instrument would cause it to read less than the actual speed. The radar car's distance and angle from the road are

²¹ *People v. Hildebrandt*, 308 N.Y. 397, 126 N.E.2d 377 (1955).

²² See Carosell and Coombs, *Radar Evidence in the Courts*, 32 *DICTA* 323 (1955) which says that the principle as applied to speed measurement and conclusion that "unchallenged concept of its operational effectiveness has been erroneous."

²³ Kopper, *supra* n.9 at 343.

²⁴ *Id.* at 351.

²⁵ See Carosell and Coombs, *supra* n.22 at 331.

also relevant factors in considering the accuracy of the measurement.²⁶

The problem of singling out the speeding vehicle is no less significant than the measurement of the vehicle's speed. "Radar is at its best in dealing with isolated targets in a relatively featureless background."²⁷ The practical difficulty becomes apparent in trying to track a speeding car on a multi-lane freeway amid the background of buildings, signs, and people. However, the radar speedometer will always record the vehicle with the highest speed. The problem becomes one of instantaneous action by the operator. He must interpret the radar results, read and assign license numbers, accurately identify the offending car, and warn the arresting officer in *two seconds* if the car is going *only forty miles per hour*.²⁸ The radar device is obviously most effective in single lane traffic approaches where the observer's judgments are less complicated. Naturally, where there is traffic in both directions, further problems of the selection of the offending car arise.

The list of imponderables is limitless.²⁹ The operators are human. The device they work with takes measurements in millionths of a second. Between these two extremes lies the practical utility of the radar speedometer measurements. It becomes highly important, therefore, that the device be checked and that the operator be qualified to handle the practical as well as the scientific problems which will arise.

Certain problems, such as the difficulty of remembering details, can be eliminated. A recording of all pertinent information at the time of metering should be made by the officer. The speed, color, kind of car, license number, and the time of day are pertinent facts to write down. The scientific evidence will have a more convincing legal foundation if the details of the moment are transcribed in a regularly kept log book.

Chemical tests for intoxication have their own sphere of practical complications. Obviously, when a person is apprehended, it is impossible to immediately administer a blood alcohol analysis.³⁰

²⁶ *Id.* at 327. No less than twenty three limiting factors are cited as effecting the accuracy of the radar speedometer including, e.g., any noise which could be picked up such as the slamming of a door.

²⁷ *Id.* at 333.

²⁸ *Id.* at 335.

²⁹ *Id.*

³⁰ DONIGAN, *supra* n.4 at 44:

"Examples of reasons for delay are unavailability of the testing equipment or qualified personnel to

The chemical testing may take place hours after the actual apprehension. The amount of the blood alcohol concentration decreases with each minute of delay. However, since the average rate of metabolism of alcohol in the body of persons is generally known, the amount of alcohol concentration at the earlier time can be accurately estimated.³¹ As a practical matter, though, the relation of the test result as close to the time of the event as possible is essential, especially if the case may be tried to a jury.

"But it is not always wise to rush things too much."³² A urine specimen taken too soon after the time of apprehension may nullify the value of a subsequent urinalysis. "The capacity to retain urine for many hours, despite the tendency of alcohol, at times, to induce urination"³³ may result in including urine excreted long before the time of apprehension. "A breath test will give an accurate determination of blood alcohol concentration only if there has been a time lapse of at least 15 minutes between consuming the last drink of alcoholic beverage and the taking of the specimen for analysis."³⁴

A further practical consideration is that the chemical tests are conducted on specimens from individuals of varying mental and physical characteristics. The conventional tests for impairment are grossly insensitive for persons who "can hold their liquor". Moreover, tests conducted have shown that there is considerable individual variation in reaction and performance under a given concentration of alcohol in the blood. "As an additive to this are the variations in degrees of skill and nervousness of different individuals."³⁵ Nevertheless, scientists have set certain percentages as indicative of the fact that one is "under the influence of" intoxicating liquor. Their findings have been incorporated into the Uniform Vehicle Code, and adopted by most states, as presumptive evidence.³⁶

take the specimen at the moment, the need sometimes to travel considerable distances before such tests can be conducted, necessity for responsible officers to investigate at the scene, or the hospitalization before officers are able to request that he submit to a chemical test."

³¹ Newman, *Proof of Alcoholic Intoxication*, 34 KY. L. J. 250, 257-258 (1945).

³² DONIGAN, *supra* n.4 at 68.

³³ Rabinowitch, *supra* n.11 at 36.

³⁴ DONIGAN, *supra* n.4 at 29.

³⁵ Newman and Fletcher, *Effect of Alcohol on Driving Skill*, 115 A. M. A. J. 1600 (1940).

³⁶ §11-902, UNIFORM VEHICLE CODE (1962):

"1. If there was at that time 0.05% or less by

Even worse than finding as drunk those who "can hold their liquor", are the suppositions of these tests that a driver is drunk when in point of fact he is seriously ill. "On regrettable occasions diabetics and persons with apoplexy or brain tumors have died in jail after wrongful arrest for supposed drunkenness."³⁷ The number of clinical symptoms in common with intoxication is well over a hundred.³⁸

Chemical tests for intoxication have inherent weaknesses, and require constant checking to eliminate erroneously high readings. In the breath tests for example, if the stomach contains a large concentration of alcohol from a recent drink, "burping, belching, or hiccoughing can give high and usually erratic readings because these physical phenomena are all ways in which a gas bubble is expelled from the stomach."³⁹ The effects of the Mellanby phenomenon⁴⁰ reduce the reliability of blood tests as indications of mental impairment. Contamination in the subject's mouth creates the possibility that the saliva test results will be erroneous. Condensation in the breath apparatus causes a loss of alcohol and a resultant erroneous reading. It has been contended that blood is undoubtedly the best choice for analysis, but unfortunately problems of convenience and "the necessity of the services of a skilled technician for the venapuncture" require that less reliable bodily substances be analyzed.⁴¹

The tests themselves must be conducted with precision. The instruments must be kept clean and sterile by antiseptics containing no alcohol. The chemicals used must be fresh and pure. Proper measurement of all chemicals and containers must be taken at constant intervals.⁴² Care must be

weight of alcohol in the person's blood, it shall be presumed that the person was not under the influence of intoxicating liquor; 2. If there was at that time in excess of 0.05% but less than 0.10% by weight of alcohol in the person's blood, such fact shall not give rise to any presumption that the person was or was not under the influence of intoxicating liquor, but such facts may be considered with competent evidence in determining whether the person was under the influence of intoxicating liquor; 3. If there was at that time 0.10% or more by weight of alcohol in the person's blood, it shall be presumed that the person was under the influence of intoxicating liquor."

³⁷ Maxwell, *Drinking and Driving*, 9 CAN. B. J. 279, 282 (1966).

³⁸ DONIGAN, *supra* n.4 at Appendix IV, 300-06.

³⁹ Taylor, *supra* n.18 at 304.

⁴⁰ See Rabinowitch, *supra* n.11 at 29-35 for a general discussion of this phenomenon.

⁴¹ Newman, *supra* n.31 at 250.

⁴² DONIGAN, *supra* n.4 at 66.

taken that alcohol is not used within the vicinity of the testing area. The possibility of errors from the latter factors requires daily blank run-throughs by competent technicians.

Successful prosecution by use of the scientific procedures described will depend ultimately on their acceptance by courts of law. If the scientific devices and their test results are ruled inadmissible, their usefulness to law enforcement agencies is nullified. Considerations must now be given to the view courts have taken of scientific evidence in traffic cases with particular emphasis placed on the admissibility of the drunkenness tests and the radar speedmeter.

PROBLEMS OF TEST ADMISSIBILITY

Courts are primarily concerned with the accuracy and reliability of the scientific evidence being offered. Courts, therefore, require that a foundation first be laid establishing the competency of the test. Witnesses, preferably experts, are required, of the prosecution, to testify as to the scientific principles involved, to interpret results, and demonstrate accuracy in each particular instance.

The process of testing for drunkenness involves three stages, each requiring testimonial substantiation. First, there is the taking of the specimen by a doctor or technician, or, in the case of a breath test, by a policeman trained in the operation of the test instruments. Here, there is the initial

problem of showing that the specimen analyzed actually was that taken from the subject person. The greater the number of persons who have handled a particular specimen, the greater the chance of mix-up, and the more difficult is the task of proving identification in the courtroom.⁴³

The prosecution may be forced to produce a string of witnesses to properly identify the specimen.⁴⁴ Many cases show the courts disapproval of careless handling procedures. The chain of evidence

⁴³ *Id.* at 75.

⁴⁴ State v. Tarcha, 3 Conn. Cir. 43, 45, 207 A.2d 72, 75 (1964). Five witnesses were brought forth to identify a particular glass tube. The court held that a proper identification was made. Other cases in which identification of specimen held sufficient: State v. Webb, 76 Idaho 162, 279 P.2d 634 (1955); City of Columbus v Marks, 118 Ohio App. 394, 194 N.E.2d 791 (1963); Zoch v. State, 160 Tex.Cr.R. 620, 273 S.W.2d 622 (1955).

must be preserved throughout, or the courts will hold the evidence inadmissible.⁴⁵

Futhermore, at this point in the chemical testing, a qualified person is required to extract the specimen. The taking of urine and breath specimens for analysis are relatively simple tasks. "For such duties as this, civilian or police personnel can be properly trained."⁴⁶ Nevertheless, certain procedures must be followed by these persons in order to insure the admissibility of the test results as evidence. They must be able to testify that all containers were clean, and that the specimens were not contaminated. The breathalyzer operator must be trained to understand the effects of condensation and temperature changes before his testimony will be rendered admissible.⁴⁷ The extraction of blood specimens should always be left to medical technicians.⁴⁸

Finally, at this first stage, courts usually require that the testing device be shown to have been functioning properly.⁴⁹ This requirement is satisfied by proof that the apparatus, in the case of the breath tests, is regularly checked by blank runs. These checks should also establish that the chemicals used are compounded to the proper percentage.⁵⁰

During the second stage, the courts generally require that a chemical or laboratory technician

⁴⁵ *Brown v. State*, 156 Tex.Cr.R. 144, 240 S.W.2d 210 (1951). Conviction set aside where only two of the many persons who had handled the specimen were called as witnesses. Accord, *Apodaca v. Baca*, 73 N.M. 104, 385 P.2d 963 (1963); *Benton v. Pellum*, 232 S.C. 26, 100 S.E.2d 534 (1957); *Rodgers v. Commonwealth*, 197 Va. 527, 90 S.E.2d 257 (1955).

⁴⁶ *DONIGAN*, *supra* n.4 at 88. See also *City of Wichita v. Showalter*, 185 Kan. 181, 341 P.2d 1001 (1959) where the results of chemical test by means of alcometer were admissible even though police operator of instrument was not able to testify to intricacies of device or condition of chemicals.

⁴⁷ See generally *Taylor*, *supra* n.18.

⁴⁸ *UNIFORM VEHICLE CODE* §11-902(d), (1962) recommends: "When a person shall submit to a blood test . . . only a physician or a registered nurse may withdraw blood. . . . This limitation shall not apply to the taking of breath or urine specimens."

⁴⁹ *State v. Miller*, 64 N.J. Super 262, 165 A.2d 829 (1960). See also *State v. Baker*, 56 Wash.2d 846, 355 P.2d 806 (1960) where it was held that for the result of breathalyzer test to be admissible, prosecution must produce *prima facie* evidence that (1) instrument was properly checked and in working order at time of test, and (2) chemicals employed were of correct kind and compounded in proper proportions.

⁵⁰ See *Hill v. State*, 158 Tex.Cr.R. 313, 256 S.W.2d 93 (1953) where such was not established and conviction was reversed. But see *State v. Warren*, 75 Ariz. 123, 252 P.2d 781 (1953) where testimony of chemist that he checked chemicals periodically was sufficient to establish reliability of drunkometer at all times.

must analyze the specimen extracted.⁵¹ The person who conducts this phase of the process should be produced, and his qualifications must be proved.

Sometimes it is preferable to use as such a witness the head of the laboratory in which the particular test was conducted rather than one of the laboratory technicians who actually ran the test for the reason that the director . . . may be able to qualify as an expert . . . to prove elements . . . other than just the details of analysis.⁵²

To do this, however, the head of the laboratory must have supervised the test in the particular case.⁵³

The operator of one of the common breath devices need not be a scientist in order to conduct an acceptable analysis. However, the courts require adequate training and experience to qualify a person to testify. "Before any person is assigned as an operator of one of these instruments, he should be trained in the basic scientific principles of its operation and the chemical technique involved."⁵⁴ If the operator is not qualified to testify as to these matters, this type of information must be supplied by someone else.⁵⁵ The usual courtroom procedure, then, is to have the operator testify as to facts he observed, and then have a qualified expert follow him on the stand to interpret what the operator observed.⁵⁶ But if the qualified expert did not supervise the operator, his testimony may constitute hearsay.⁵⁷

The analysts who conduct tests on blood or urine are usually specialists in this field. They are qualified to testify since their work necessarily requires

⁵¹ *UNIFORM VEHICLE CODE* §11-902(c), (1962) which recommends that there be legislation in each state requiring supervision at the state level of all chemical test programs. A number of states have done so, e.g., Arkansas, Connecticut, Georgia, Maryland, Minnesota, Nebraska, North Carolina, North Dakota, Pennsylvania, Rhode Island, and Virginia.

⁵² *DONIGAN*, *supra* n.4 at 91.

⁵³ *Hill v. State*, 158 Tex.Cr.R. 313, 256 S.W.2d 93 (1953).

⁵⁴ *DONIGAN*, *supra* n.4 at 92. See *Fortune v. State*, 197 Tenn. 691, 277 S.W.2d 381 (1955). Testimony of police officer who ran test on drunkometer but who lacked knowledge of principles of operation and who could not translate readings, showed he was not qualified as an expert witness.

⁵⁵ See *Riddle v. State*, 288 P.2d 761 (Okla. Crim. App. 1955). Accord, *Fortune v. State*, 197 Tenn. 691, 277 S.W.2d 381 (1955).

⁵⁶ *Alexander v. State*, 305 P.2d 572, 586 (Okla. Crim. App. 1956).

⁵⁷ *Id.*

an understanding of the scientific principles and chemical techniques involved.⁵⁸

In the third phase of testing, an expert interprets the results obtained by the technicians. This aspect has been alluded to in connection with the breath test results taken by a policeman not familiar with the theory of the test.⁵⁹ Included in this area is the necessity for a qualified expert to tell the court what the blood-alcohol ratio means.⁶⁰ This opinion requires technical training in the physiological effects of alcohol on the human body. A chemist conducting a blood test may not be qualified to discuss the blood-alcohol ratio.⁶¹

Finally, in this third stage, courts require expert testimony as to the reliability of the specific method used. This witness must be thoroughly familiar with the scientific principles of, and proper techniques required in conducting, the test in issue. However, judicial notice⁶² of the reliability of the techniques used to analyze blood, urine, and breath is now more commonly taken. In some jurisdictions, legislative approval of the reliability of the drunkometer has been given,⁶³ and the Supreme Court of New Jersey has held that judicial notice of breath devices is now well recognized:

The drunkometer is sufficiently established and accepted as a scientifically reliable and accurate device for determining the alcoholic content of the blood to admit testimony of the reading obtained upon a properly conducted test, without any need for antecedent expert testimony by a scientist that such reading is a trustworthy index of blood alcohol, or why.⁶⁴

The effect of judicial notice on the admissibility of scientific evidence in traffic cases is vitally important to law enforcement agencies. Judicial

notice establishes general recognition of the scientific evidence offered. The requirements of proper testing, qualified operators, and periodic checking are retained. However, the practical result is that the scientific evidence becomes more conclusive upon admission when expert testimony is no longer required to prove its reliability. A defendant can no longer rely on a court's doubt concerning the reliability of the evidence being offered against him, and must present substantial countervailing evidence to rebut the presumption of guilt thus produced.⁶⁵

At this point, consideration of the legal effect of the radar speedmeter should be attempted because it is here that judicial notice is most prevalent. Most courts have adopted the view that "the usefulness of radar equipment for testing the speed of vehicles has now become so well established that testimony of an expert to prove reliability of radar in this respect is not necessary and courts will take judicial knowledge of such fact."⁶⁶ Where judicial notice has not been taken, the scientific theory upon which the use of the radar speedmeter is based must be shown by expert testimony. Once the scientific theory is established by expert testimony, the practical effect is usually the same as if the court had taken judicial notice of the theory.

⁵⁸ See the following cases in point: *State v. Weise*, 75 Idaho 404, 273 P.2d 97 (1954); *Block v. State*, 125 Colo. 36, 240 P.2d 512 (1951); *State v. Koenig*, 240 Iowa 592, 36 N.W.2d 765 (1949); *Gamez v. State*, 171 Tex.Cr.R. 17, 353 S.W.2d 419 (1961).

⁵⁹ See n.54.

⁶⁰ *Hill v. State*, 158 Tex.Cr.R. 313, 256 S.W.2d 93 (1953).

⁶¹ *Lopez v. State*, 154 Tex.Cr.R. 227, 225 S.W.2d 852 (1949).

⁶² "The true nature of what is judicially known is that it is something which is already in the court's possession or, at any rate, is so accessible that it is unnecessary and therefore time wasting to require evidence of it." *State v. Tomanelli*, 153 Conn. 365, 370, 216 A.2d 625, 628 (1966).

⁶³ See *McDonald v. Ferguson*, N.D., 129 N.W.2d 348 (1964) holding North Dakota's legislation valid; also Maryland, Ohio, Virginia.

⁶⁴ *State v. Johnson*, 42 N. J. 146, 170, 199 A.2d 809, 822 (1964).

⁶⁵ Compare *People v. Johnson*, 8 Misc.2d 408, 165 N.Y.S.2d 906 (1957), where in the absence of expert testimony as to accuracy of radar speed recording device, evidence merely disclosing the reading of such device was insufficient to sustain conviction for violation of speeding ordinances, with *People v. Magri*, 3 N.O.2d 562, 170 N.Y.S.2d 335 (1958) where court no longer considered it necessary to require expert testimony as to the nature of the scientific principles involved, and upheld conviction by simply combining the radar readings with the independent observations of speed by the police officers. The type of countervailing evidence the defendant may present is limited. One possible defense is that cars going in the opposite or the same way affected the results of the recording device. Another possible defense is the short length of time the vehicle is under radar observation. Neither defense is accorded too much weight in jurisdictions which take judicial notice of the principles of radar detection.

⁶⁶ *Everight v. Little Rock*, 230 Ark. 695, 697, 326 S.W.2d 796, 797 (1959). Accord, *State v. Tomanelli*, 153 Conn. 365, 369, 216 A.2d 625, 627 (1966), "... the scientific accuracy of the Doppler-shift principle for measurement of speed, if the principle is correctly applied, is, in the discretion of the court, a proper subject of judicial notice . . .". See generally *E.S. v. Drees*, D.C., 156 F.Supp 200 (1957); *State v. Graham*, 322 S.W.2d 188 (Mo. App. 1959); *People v. Johnson*, 23 Misc.2d 11, 196 N.Y.S.2d 227 (1960). But see 11 AM. JUR. PROOF OF FACTS, SPEED, SUPP. 18-34 (1966) where the type of testimony required to explain the theory of operation and general scientific accuracy of the radar speedmeter is outlined.

"Judicial notice does not extend to accuracy or efficiency of any given police radar instrument . . . , whether the instrument itself is accurate and is accurately operated, must necessarily be demonstrated to the satisfaction of the trier [of fact]. . . ." ⁶⁷

The courts have developed several requirements as to what has to be shown by the prosecution prior to admission of even judicially recognized evidence. Generally, the courts require answers to two questions: (1) How accurate was the machine functioning at the time the accused's speed was checked, and (2) was the radar speedmeter properly operated?⁶⁸

The answer to the first question will depend on how often, and under what circumstances, the radar equipment was checked. A "before and after" test has been accepted by several courts.⁶⁹ This test is accomplished by one officer driving his car through the beam of the radar speedmeter operated by another officer, and by radio communication they compare the radar dial reading with the speedometer reading of the car. "If the readings coincide, the officers consider the radar meter as functioning properly and proceed to apprehend speeding motorists. The same check is normally made after the completion of its use for the day." ⁷⁰ The requirements for checking are made considerably harder in some courts, which demand that the tuning forks themselves be checked periodically.⁷¹ To insure the validity of the test, most judges rule that the speedometer against which the radar speedmeter is checked must itself be tested from time to time.⁷² Each change in location has been held by some courts to necessitate another equipment check.⁷³ These latter requirements are summed up in one opinion that indicates that the value of any test of a radar speedmeter depends upon the accuracy of the measuring device against which it is checked.⁷⁴

⁶⁷ State v. Tomanelli, 153 Conn. 365, 372, 216 A.2d 625, 629 (1966).

⁶⁸ See Note, *Radar Traffic Controls*, 23 TENN. L. REV. 784 (1955); See also Hardaway v. State, 202 Tenn. 94, 302 S.W.2d 351 (1957) where judicial notice taken if radar speedmeter is tested for accuracy from time to time, and when properly operated.

⁶⁹ Cromer v. State, 374 S.W.2d 884 (Tex. Crim. App. 1964).

⁷⁰ See Note, *supra* n.68 at 793.

⁷¹ St. Louis v. Boecker, 370 S.W.2d 731 (Mo. App. 1963).

⁷² People v. Johnson, 23 Misc.2d 11, 196 N.Y.S.2d 227 (1960).

⁷³ St. Louis v. Boecker, 370 S.W.2d 731 (Mo. App. 1963).

⁷⁴ State v. Graham, 322 S.W.2d 188, 197 (Mo. App. 1959).

Finally, the qualifications of the tester must be established. This requirement has become less demanding, however, as the use of the radar speedmeter becomes more widespread.⁷⁵

A strict requirement has been announced in one case to the effect that certain court recommendations⁷⁶ would have to be followed to fully protect the rights of the defendant.⁷⁷ If these recommendations were not followed, the state's case would not be strong enough to require a conviction. The considerations here were set forth to control the weight to be accorded such evidence⁷⁸ as well as to its admissibility.

Admissibility of the radar speedmeter evidence, in some jurisdictions, is not absolutely contingent on the testing requirement. "A reading from an untested speedometer or radar device is *admissible*, but is not, without more, sufficient for a speeding conviction." ⁷⁹ The additional evidence can come from a witness "with specific experience and familiarity with motor vehicles and their speed." ⁸⁰

A final requirement in some courts relates to both the chemical tests and the speed measuring devices.⁸¹ "All evidence which is not founded upon

⁷⁵ See People v. Johnson, 23 Misc.2d 11, 196 N.Y.S.2d 227 (1960) where a state trooper who attended two radar schools and worked with radar for more than a year was qualified to state an *opinion* as to operation of radar equipment; cf. Dr. Kopper's statement in People v. Katz, 205 Misc. 522, 129 N.Y.S.2d 8 (1954): "an operator unskilled in electronics can *quite easily* determine when the machine is not functioning properly." See also Dietze v. State, 162 Nebr. 80, 75 N.W.2d 95 (1956) where experience of the operator with the device was sufficient to establish the accuracy of the machine.

⁷⁶ See St. Louis v. Boecker, 370 S.W.2d 731, 737 (Mo. App. 1963).

(1) Allow the set to warm up, (2) check to see that the dial reads zero, (3) since diathermy machines, swinging signs, swaying trees, and other outside sources can give false readings, examine the meter for such indications, (4) check accuracy by run-through test, both before and after the period of observation, by having a car with a calibrated speedometer run through the zone twice at two different speeds, and (5) that if the difference between the speedometer reading and the radar meter is greater than two miles per hour, that a further check be made.

⁷⁷ People v. Sachs, 1 Misc.2d 148, 165, 147 N.Y.S.2d 801, 809 (New York City Magis. Ct. 1955).

⁷⁸ See discussion in text at n.170-177, *infra*.

⁷⁹ People v. Fletcher, 216 N.Y.S.2d 34 (1961). Accord People v. Johnson, 23 Misc.2d 11, 196 N.Y.S.2d 227 (1960).

⁸⁰ People v. Tanner, 6 Misc.2d 1007, 1010, 165 N.Y.S.2d 308, 311 (1957).

⁸¹ Note that the discussion has centered on the radar speedmeter device. The same requirements are applicable to the speed-watch device (Prather Speed Device) and the photo-patrol instrument. See in relation to speed-watch: People v. Kenney, 354 Mich. 191, 92 N.W.2d 335 (1958); People v. Asheroff, 12 Misc.2d 10, 174 N.Y.S.2d 525 (1958); People v. Jamison, 8 Misc.2d

the personal knowledge of the witness from whom it is elicited and which consequently does not depend for its credibility and weight upon the confidence which the court or jury may have in him" ⁸² is hearsay. "Evidence of this kind is not admissible when offered to prove the truth of the matter therein asserted." ⁸³

Several situations have been alluded to which would fall under the ambit of the hearsay rule,⁸⁴ but for the growing area of exceptions. Some of these exceptions are founded on the principle that evidence, though technically hearsay because not within the personal knowledge of the witness who testifies, is reliable because certain circumstances assure trustworthiness. Another ground for an exception to the hearsay rule is necessity. In some cases hearsay may be the only evidence available and justice would fail if it were to be rejected.⁸⁵

A notable situation regarding the hearsay rule arose in connection with an attempt to establish the accuracy of the radar speedometer. In *People v. Offerman*, the court ruled that the testimony of each of the officers as to the test results would be hearsay because

... it seems clear that when Officer Kelly testified that the reading on the dial in the radar car corresponded to the reading of the speedometer in the pickup car, he was relying upon what Officer Chaplain had told him over the radio, and when Officer Chaplain testified that the reading on the dial in the radar car corresponded with the reading on the speedometer of the pickup car, he was relying on what Officer Kelly told him over the radio. Thus, the testimony of each as to the reading on the instrument of the car of the other was hearsay.⁸⁶

In *State v. Dantonio*, the same question was raised, but the court reached a different conclusion.

408, 165 N.Y.S.2d 906 (1957), and in relation to the photo-patrol device: *People v. Pett*, 13 Misc.2d 975, 977, 178 N.Y.S.2d 550, 551 (1958) which required "expert testimony as to the scientific principles underlying the device, along with other evidence that expert inspected the device the evening of use, and further tests conducted after the defendant was photographed."

⁸² DONIGAN AND FISHER, *THE EVIDENCE HANDBOOK* 27 (1965).

⁸³ *Id.*

⁸⁴ Such as those in text at n.9-10, n.43-44, and n.52-53, *supra*.

⁸⁵ See 3 WIGMORE ON EVIDENCE §1421, 1422 (3d ed. 1940).

⁸⁶ 204 Misc. 769, 774, 125 N.Y.S.2d 179, 182 (1953).

Each officer testifies as to independent facts. The patrol car officer testifies as a fact to the speed of the patrol as shown by his speedometer. The radar operator testifies as to the recording of the electric speedometer and the graph machine and of his own visual observation of the car making the test. Radio communication is merely incidental. The fact of the speed of the patrol car and the recording of the electric speedometer, the graph machine, the observation of the radar operator remain the same without the benefit of radio communication.⁸⁷

The view in the *Offerman* case is questionable. One commentator noted that "if both officers are in court and subject to cross examination, it is hard to see how the testimony is objectionable." ⁸⁸ The hearsay rule seems to be overly technical in this situation, and should be discarded.

The hearsay problem can be seen very clearly in one aspect of the introduction of chemical test results "where proponents of the chemical test evidence have attempted to prove essential elements of their cases solely by means of written reports, chemists' certificates of their records, hospital records, and others." ⁸⁹ The facts attempted to be shown included identification of the person as the one whose specimen was analyzed, and the results of the analysis. Courts have frequently held such evidence to be inadmissible hearsay unless used solely to refresh the witness' recollection.⁹⁰ If the witness on the stand has no direct knowledge, except for the hospital records, that the specimen is that of the defendant, "his testimony respecting the result of the test is pure hearsay so far as the defendants were concerned." ⁹¹

However, not all courts have held chemical test reports inadmissible as hearsay evidence, particularly when the identity of the person from whom the specimen was extracted is not in doubt. One case allowed the report of the state department of health to be admissible to show the result of the analysis without the testimony of the chemist who performed it. The court held that such a

⁸⁷ 31 N.J.Super. 105, 109, 105 A.2d 918, 921 (1954).

⁸⁸ See Note, *Radar Traffic Controls*, 23 TENN. L. REV. 784, 794 (1954). See also Woodbridge, *Radar in the Courts*, 40 VA. L. REV. 809, 815 (1954).

⁸⁹ DONIGAN, *supra* n.4 at 82.

⁹⁰ See DONIGAN AND FISHER, *supra* n.82 at 114-115.

⁹¹ *Natwick v. Moyer*, 177 Or. 486, 493, 163 P.2d 936, 939 (1945). To same effect of inadequate identification of person from whom specimen taken see: *Bauer v. Veith*, 374 Mich. 1, 130 N.W.2d 897 (1964); *McGowan v. Los Angeles*, 100 Cal.App.2d 386, 223 P.2d 862 (1950).

report was part of the official records of a public officer and therefore was an exception to the hearsay rule.⁹²

In some jurisdictions, courts have approved the admissibility of hospital reports, chemists' certificates, or police reports as entries made in the regular course of business.⁹³ "The evidence must consist of the original entries, made at a time reasonably contemporaneous with the act, event, or transaction thereby recorded, and it is this element which furnishes the necessary guarantee of the reliability."⁹⁴ Many states now have adopted the Uniform Business Records as Evidence Act, which makes any kind of record admissible "if shown to have been made in the regular course of business, at or near the time of the transaction. . . ."⁹⁵

Another area involving hearsay is testimony of a laboratory director or supervisor as to facts outside his first hand knowledge. If the director was not present when the analysis was conducted and must depend upon what is told him as to the results of that analysis, his testimony is hearsay and inadmissible.⁹⁶ But "if a chemist . . . is present and observes the . . . test, or if it is made under his supervision, he may testify as to the result of the test."⁹⁷

The two general exceptions noted above⁹⁸ find valuable applicability in this area of hearsay. The

⁹² *Smith v. Mott*, 100 So. 2d 173 (Fla. 1957). *But see State v. Reenstierna*, 101 N.H. 286, 140 A.2d 572 (1958) holding that a letter from the state department of health relating to a blood analysis was not such an official report as to constitute an exception to the hearsay rule. *See generally DONIGAN AND FISHER, supra* n.82 at 82-85 for discussion of public records exception.

⁹³ *Thomas v. Hogan*, 308 F.2d 355 (2d Cir. 1962); *Interstate Life & Accident Ins. Co. v. Whitlock*, 112 Ga.App. 212, 144 S.E.2d 532 (1965) where official report of state crime laboratory admissible. *Contra, Bauer v. Veith*, 374 Mich. 1, 130 N.W.2d 897 (1964) where hospital record not admissible because hospital not required to keep record of blood analysis in cases where subject is not a patient.

⁹⁴ *DONIGAN AND FISHER, supra* n.82 at 86.

⁹⁵ *Id.*

⁹⁶ *State v. Gagnon*, 151 Me. 501, 503, 121 A.2d 345, 346 (1956).

⁹⁷ *Leonard v. State*, 161 Tex.Cr.R. 470, 278 S.W.2d 313 (1955). *See also State v. Bailey*, 184 Kan. 704, 339 P.2d 45 (1959) where testimony of chemist as to method and reliability of blood analysis made by another was admissible; *Mozley v. State*, 163 Tex.Cr.R. 244, 289 S.W. 939 (1956) where the biochemist who supervised test was allowed to testify; *Bryan v. State*, 157 Tex.Cr.R. 592, 252 S.W.2d 184 (1952) where result of blood analysis could be testified to by chemist who was present and supervised analysis made by another person.

⁹⁸ *See text at n.84-85, supra.*

trustworthiness exception can be founded on the fact that the law enforcement agents are testifying to the readings on the radar or chemical test devices. These have been judicially proven in court to be reliable. The hearsay policy is to keep out of court unreliable declarations offered to prove the truth of their content. Moreover, necessity requires the admission of certain evidence which would otherwise be unobtainable.⁹⁹

The hearsay discussion concludes the section devoted to the court's requirements for admissibility of scientific evidence. The prosecution can fulfill these requirements quite easily by following a set procedure in any case employing scientific test methods.¹⁰⁰ However, the prosecution may also have to contend with a defendant's objections against admissibility on grounds involving a denial of constitutional rights.

Constitutional Implications of Intoxication Tests

The previous discussion of chemical tests for intoxication has assumed a defendant who willingly submitted to being tested. A variety of problems have arisen where such is not the case. The leading case on compulsory infringement of physical integrity is *Rochin v. California*.¹⁰¹ In *Rochin*, police officers, engaged in an illegal search, observed the defendant swallow two capsules believed to contain narcotics. Over *Rochin's* objections, a doctor forced him to regurgitate the capsules by inducing an emetic into his stomach through a tube. The capsules were subsequently used in evidence against him. The Supreme Court found this conduct repugnant to notions of due process, holding:

We are compelled to conclude that the proceedings by which this conviction was obtained do more than offend. . . . This is conduct that shocks the conscience . . . bound to offend even hardened sensibilities.¹⁰²

The applicability of this due process test of admissibility can be seen quite readily in a forcible

⁹⁹ Note in this respect *City of Seattle v. Bryan*, 53 Wash.2d 321, 313 P.2d 680 (1958) where facts outside of the police officer's own knowledge were testified to and admitted over the objection of the defendant that such evidence was hearsay.

¹⁰⁰ *See MANUAL, supra* n.15 at BORKENSTEIN, SUGGESTIONS FOR ORGANIZING A PROGRAM OF CHEMICAL TESTS FOR INTOXICATION; and Dr. Kopper's suggestions in Kopper, *supra* n.9 at 343, for procedures to be followed in radar testing.

¹⁰¹ 342 U.S. 165 (1952).

¹⁰² *Id.* at 172.

extraction of a blood specimen and less readily in the compulsion of a urine or breath specimen. However, fortunately for the future of chemical testing, the later *Breithaupt* decision¹⁰³ of the Supreme Court held that here is nothing inherently "brutal" or "offensive" in the taking of a blood specimen from an unconscious motorist. This decision therefore limits the due process holding of *Rochin*¹⁰⁴ to clearly excessive force:

the absence of consent, without more, does not render the taking a violation of a constitutional right; and certainly the test as administered here would not be considered offensive by even the most delicate.¹⁰⁵

Earlier state court decisions had foreshadowed the view later adopted by the Court in *Breithaupt*. In an Arizona case,¹⁰⁶ the defendant had been forced to submit to a drunkometer test, and the *Rochin* rule was held inapplicable. Later, a California case allowed chemical tests to be admitted over the objections of a defendant who claimed that her blood had been forcibly taken.¹⁰⁷

The most important Supreme Court ruling on the subject of compulsory blood tests has come in *Schmerber v. California*.¹⁰⁸ *Schmerber* accepted the *Breithaupt* decision, but noted it left unanswered the question of when a forcible extraction is so clearly excessive as to fall under the *Rochin* doctrine. However, the Court concluded that, in

¹⁰³ *Breithaupt v. Abram*, 352 U.S. 432 (1957).

¹⁰⁴ Note that the *Rochin* decision has been narrowly construed in *Mapp v. Ohio*, 367 U.S. 643 (1961), and by the Fifth Circuit in *Lane v. United States*, 321 F.2d 573 (5th Cir., 1963), which said that general concepts of due process are not violated by forcible invasion of the body in particular, but by illegal police conduct in general.

¹⁰⁵ *Breithaupt v. Abram*, 352 U.S. 432, 435-436 (1957). Note that Chief Justice Warren, writing in dissent, found *Rochin* and *Breithaupt* indistinguishable.

¹⁰⁶ *State v. Berg*, 76 Ariz. 96, 259 P.2d 261 (1953). Note that the facts of this case seem quite conclusive on the defendant's side. The defendant protested against being given a breath test. Nevertheless, the officers had him strapped to a chair and one held the defendant's head steady while the other captured his exhaled breath in a container held up in front of his mouth.

¹⁰⁷ *People v. Haesaler*, 41 Cal.2d 252, 260 P.2d 8 (1953), cert. denied, 347 U.S. 931 (1953). See also *People v. Huber*, 232 Cal.App.2d 663, 43 Cal.Rptr. 65 (1965).

¹⁰⁸ 384 U.S. 751 (1966): Officer took blood specimen from injured defendant who was in hospital, but under arrest for driving while under influence of intoxicants. Result of subsequent chemical test of blood was held admissible despite fact lawyer had advised defendant not to submit to test and therefore he had protested the extraction of blood from his body.

this instance, the manner of extraction was reasonable:

It would be a different case if the police initiated the violence, refused to respect a reasonable request to undergo a different form of testing, or responded to resistance with inappropriate force.¹⁰⁹

If literally interpreted, *Schmerber* suggests that force may be legitimately used if not excessive when compared with that employed by the defendant. Furthermore, the decision seems to adopt the view that societal interests in preventing drunk driving outweigh individual interests in physical integrity.

Due process arguments in this field may have been dealt a blow by *Schmerber*, but several other constitutional contentions were also considered. The defendant in *Schmerber* contended that since the blood test taken involved a measure of compulsion, his Fifth Amendment rights were violated.¹¹⁰ This argument is not unique in chemical test cases. The *Schmerber* Court, in rejecting the accused's contention, employed the historical limitation¹¹¹ on the scope of the self-incrimination privilege when it held that "the privilege against self-incrimination protects an accused only from being compelled to testify against himself, or otherwise provide the state with evidence of a testimonial or communicative nature..."¹¹² The privilege, then, does not extend inviolability to the body.

Most other courts have held, consistent with the Supreme Court's historical view of the privilege, that blood, urine, or breath tests taken without the consent of, or against the will of a person, are nevertheless admissible, since this type of evidence is considered physical rather than testimonial. Cases arising in respect to unconscious or semi-conscious persons are directly in point. Consent

¹⁰⁹ *Id.* at 760.

¹¹⁰ *Malloy v. Hogan*, 378 U.S. 1 (1964) held that the Fifth Amendment privilege against self-incrimination was applicable to the states through the Fourteenth Amendment.

¹¹¹ See Inbau, *Self-Incrimination—What Can an Accused Person Be Compelled To Do?*, 28 J. Crim. L.C. & P.S. 267 (1937) where an historical review is undertaken. See also Ladd, *The Medico-Legal Aspects of the Blood Test to Determine Intoxication*, 24 IOWA L. REV. 191, 226 (1939).

¹¹² 384 U.S. 751, 761 (1966). Note that the dissenters saw the "self" as a totality, mind and body are within the scope of the protection of the privilege as they defined it.

here is obviously lacking yet the courts have consistently held that specimens extracted are admissible because they are not testimony.¹¹³

The prohibition of compelling a man in a criminal court to be a witness against himself is a prohibition of the use of physical or moral compulsion to extort communications from him, not an exclusion of his body as evidence when it may be material.¹¹⁴

Contrary to long established judicial precedent on the subject, however, some few courts have expanded the scope of the self-incrimination privilege to include physical invasions of the body for the purpose of chemical testing. These courts require that a motorist must "expressly and voluntarily consent to such tests before any evidence thereof shall be admissible in a subsequent criminal prosecution against him."¹¹⁵ The rule was first applied in a Texas case,¹¹⁶ and now has been accepted in Oklahoma¹¹⁷ and Maine.¹¹⁸

Even in these jurisdictions though, the privilege may be waived. The courts will find waiver when there is a voluntary consent to take the tests.¹¹⁹ Defense counsel, however, may still try to raise the privilege in cases where it seems the "consent" was given while the defendant was "under the influence of" alcohol. This contention is predicated on the assumption that if the defendant was "unfit to operate a motor vehicle, then he was too much

under the influence of alcohol to be mentally capable of waiving any constitutional rights and therefore the alleged consent was invalid. . . ." ¹²⁰ However, courts have distinguished between what makes a motorist unfit to drive, and that impairment of the mind which renders him incapable of validly consenting to chemical testing. A higher degree of intoxication is required for the latter.¹²¹

An interesting new constitutional objection has been raised with respect to the warning requirement. Courts generally have held¹²² that a motorist need not be warned of any right to refuse to submit to a chemical test.¹²³ The privilege could therefore be impliedly waived by a failure to object¹²⁴ or by submitting to the test after being informed that favorable test results would result in no charge.¹²⁵

In *Miranda v. Arizona*,¹²⁶ the Supreme Court ruled that the government must respect the inviolability of the person,¹²⁷ and procure evidence against an accused by independent efforts.¹²⁸ Is the implied waiver doctrine consistent with the *Miranda* ruling? The efforts by the Court in *Miranda* and *Schmerber* are directed at quite different evils. In *Miranda*, the Court was interested in remedying one evil—the inherently coercive atmosphere of incommunicado police interrogation. The *Schmerber* case did not present this evil. "When the blood test is administered, there is neither an overriding compulsion to speak nor any trickery aimed at eliciting information." ¹²⁹ The warning requirement, and the right to counsel privilege as they relate to self-incrimination should vary with the context of each case. The application of these rights in the chemical testing field would

¹²⁰ DONIGAN, *supra* n.4 at 163.

¹²¹ *Halloway v. State*, 146 Tex.Cr.R. 353, 175 S.W.2d 258 (1943) where a blood alcohol concentration of 0.275% was not sufficient to render the defendant incapable of "knowing what he was doing." Accord, *Maudlin v. State*, 239 Md. 592, 212 A.2d 502 (1965).

¹²² *People v. Ward*, 307 N.Y. 73, 120 N.E.2d 211 (1954); *State v. Duguid*, 50 Ariz. 276, 72 P.2d 435 (1937); *City of Columbus v. Glenn*, 102 N.E.2d 279 (Ohio App. 1950); *People v. Bellah*, 237 Cal.App.2d 122, 46 Cal.Rptr. 598 (1965).

¹²³ Especially in the absence of a statute requiring otherwise.

¹²⁴ *State v. Koenig*, 240 Iowa 592, 36 N.W.2d 765 (1949); *State v. Duguid*, 50 Ariz. 276, 72 P.2d 435 (1937).

¹²⁵ *Hinkefent v. State*, 267 P.2d 617 (Okla. Crim. App. 1954) where defendant submitted to the test only when officers told him no charges would be filed if he was found not to be intoxicated by the test.

¹²⁶ *Miranda v. United States*, 384 U.S. 436 (1966).

¹²⁷ *Id.* at 460.

¹²⁸ *Id.*

¹²⁹ See Note, 44 TEXAS L. REV. 1619 (1966).

¹¹³ From an unconscious person: *Breithaupt v. Abram*, 352 U.S. 432 (1957); *People v. Haeusaler*, 41 Cal.2d 252, 260 P.2d 8 (1953); *State v. Ayers*, 70 Idaho 18, 211 P.2d 142 (1949); *State v. Cram*, 176 Ore. 577, 160 P.2d 283 (1945); *People v. Peck*, 199 Cal. App.2d 857, 19 Cal.Rptr. 186 (1962). From a semi-conscious person: *Block v. People*, 125 Colo. 36, 240 P.2d 512 (1951); *State v. Sturtevant*, 96 N.H. 99, 70 A.2d 909 (1950); *People v. Tucker*, 88 Cal.App.2d 333, 198 P.2d 941 (1948).

¹¹⁴ *Holt v. United States*, 218 U.S. 245, 252-53 (1910).

¹¹⁵ DONIGAN, *supra* n.4 at 159.

¹¹⁶ *Apodaca v. State*, 140 Tex.Cr.R. 593, 146 S.W.2d 381 (1940). Accord, *Trammel v. State*, 162 Tex.Cr.R. 543, 287 S.W.2d 487 (1956).

¹¹⁷ *Cox v. State*, 395 P.2d 954 (Okla. Crim. App. 1964). Accord, *Lorenz v. State*, 406 P.2d 278 (Okla. Crim. App. 1965).

¹¹⁸ *State v. Merrow*, 161 Me. 111, 208 A.2d 659 (1965).

¹¹⁹ *State v. Morkind*, Iowa, 286 N.W. 412 (1939); *See State v. Johnson*, 252 Iowa 1052, 135 N.W.2d 518 (1965) where informing the defendant of possible revocation of license in case of refusal to submit to test did not constitute coercion in obtaining test. *See also* recent decisions in accord, *City of Toledo v. Dietz*, 3 Ohio St.2d 30, 209 N.E.2d 127 (1965), *cert. denied*, 382 U.S. 956 (1965); *People v. Sykes*, 238 Cal.App.2d 156, 47 Cal.Rptr. 595 (1965).

surely destroy the test's effectiveness since time is of the essence. For these reasons, *Schmerber* and a number of cases preceding it have found no denial of constitutional rights in the absence of a warning or the denial of permission to contact a lawyer.¹³⁰ An interesting aspect of a holding that compulsory testing does not constitute a violation of the self-incrimination privilege is that the prosecution will, as a general rule, be permitted to introduce evidence of an accused's refusal to submit to the taking of a specimen of blood, urine, or breath. This rule is founded on the "premise that a refusal to submit . . . is a circumstance indicating consciousness of guilt. . . ." ¹³¹

Although the blood test in *Schmerber* did not violate the Fifth Amendment, due process, or right to counsel privilege, the Court was also faced with the contention that the test constituted an "unreasonable search and seizure" under the Fourth Amendment.¹³² The Supreme Court recognized that the extraction of blood is a search and seizure within the meaning of the Fourth Amendment. The Court, therefore, considered the permissible scope of extraction and placed two requirements on administering a blood test. First, probable cause must exist, which means there must be a "clear indication" that the desired evidence, a high blood alcohol content, will be found.¹³³ Furthermore, the Court held it necessary that the test be administered by medical personnel in a medical environment.¹³⁴ This latter requirement suggests that a test administered by the police in a police station would be considered unreasonable.¹³⁵

With respect to the "clear indication" test and

¹³⁰ See the following cases in point: *State v. Randolph*, 241 Ore. 479, 406 P.2d 791 (1965); *State v. Lee*, 246 S.C. 311, 143 S.E.2d 604 (1965); *Parker v. State*, 397 S.W.2d 853 (Tex. Crim. App. 1966); *State v. Plourde*, 3 Conn.Cir. 465, 217 A.2d 423 (1965); *Phelps v. State*, 404 P.2d 687 (Okla. Crim. App. 1965). *Contra*, *City of Tacoma v. Heater*, 67 Wash.2d 733, 409 P.2d 867 (1966) where denial of defendant's requests to call his lawyer were regarded as sufficient basis to entitle him to be discharged.

¹³¹ *DONIGAN*, *supra* n.4 at 166. See *State v. Gattton*, 60 Ohio App. 192, 20 N.E.2d 265 (1938); *Lanford v. People*, 159 Colo. —, 409 P.2d 829 (1966); *Gardner v. Commonwealth*, 195 Va. 945, 81 S.E.2d 614 (1954); *State v. Benson*, 230 Iowa 1168, 300 N.W. 275; *Phelps v. State*, 404 P.2d 687 (Okla. Crim. App. 1965).

¹³² *Mapp v. Ohio*, 367 U.S. 643 (1961) made that provision of the Fourth Amendment applicable to the states through the Fourteenth Amendment. Note that this privilege may be waived by voluntary consent: *DONIGAN*, *supra* n.4 at 115.

¹³³ 384 U.S. 751, 770 (1966).

¹³⁴ *Id.* at 771-772.

¹³⁵ *Id.*

the reasonableness requirement of the Fourth Amendment, attention should be given to the effect of delay. The emergency of the situation calls for a test to be taken while the alcohol is still in the blood. Delay would threaten "destruction of the evidence." In the case of an unconscious person, the only way to determine the fact of intoxication is by a chemical test, and certainly this should not be considered unreasonable. Furthermore, public interest is best served by discouraging drunk driving and

so long as the measures adopted do not amount to a substantial invasion of individual rights, society must not be prevented from seeking to combat this hazard to the safety of the public. The extraction of blood for testing purposes is an experience which, every day, many undergo without hardship or ill effects. When this fact, together with the scientific reliability of blood alcohol tests in establishing guilt or innocence, is considered in light of the imperative public interest involved, the taking of a sample for such a test without consent cannot be regarded as an unreasonable search and seizure. . . . ¹³⁶

The significant number of defendants who refuse to submit to the chemical tests must be recognized.¹³⁷ Because of this some states have enacted implied consent laws¹³⁸ which require that any person who operates a motor vehicle shall be deemed to have consented to the administration of a chemical test. Refusal to submit is a ground for revocation of driving privileges.¹³⁹ The constitu-

¹³⁶ *People v. Duroncelay*, 48 Cal.2d 766, 771, 312 P.2d 690, 693 (1957). See also *People v. Lane*, 240 Cal.App.2d 634, 49 Cal.Rptr. 712 (1966); *Smith v. State*, 311 P.2d 275 (Okla. Crim. App. 1957), intoximeter test given; *Fletcher v. State*, 164 Tex.Cr.R. 321, 298 S.W.2d 581 (1957), blood test given. *Contra*, *Lee v. United States*, 98 U.S.App. D.C. 97, 232 F.2d 354 (1956).

¹³⁷ See *DONIGAN*, *supra* n.4 at 175-176; statistics indicating that an enormous percentage of defendants refuse to submit to the chemical testing.

¹³⁸ New York was the first to enact such a statute (1953). Since then Connecticut, Idaho, Iowa, Kansas, Minnesota, Missouri, Nebraska, New Hampshire, North Dakota, Oregon, South Dakota, Utah, Vermont, Virginia, and most recently Rhode Island (1966). Some state provisions, however, place restrictions on the law enforcement agencies which give chemical tests. Such conditions in some implied consent statutes hamper the effectiveness of their supposed grant. See *State v. Ball*, 123 Vt. 26, 179 A.2d 466 (1962) where the court expressed concern over the shortcomings of their state statute.

¹³⁹ See *Mamet, Constitutionality of Compulsory Chemical Tests to Determine Alcoholic Intoxication*, 36

tionality of these statutes has been uniformly upheld.¹⁴⁰ States which have such statutes in effect will be able to set to rest the issues of self-incrimination, search and seizure, and due process. It may be, however, that by impliedly granting a right to refuse to take the test, these statutes would preclude forcible extraction. *Schmerber* gave clearance to compelled intrusions if justified by the circumstances, or if not made in an improper manner.¹⁴¹ The net result paradoxically may be that *Schmerber* will induce some states to repeal their implied consent laws.¹⁴²

Radar Tests and the Doctrine of Entrapment

Entrapment, in special circumstances, may preclude the admissibility of the results of radar speedmeter or other speed tests. As Professor Woodbridge has said, "Neither animal nor human likes to be trapped."¹⁴³ Entrapment has been defined as the "planning of a crime by the State's employees, and the procurement by improper inducement of its commission by one who would not have done it but for such trickery."¹⁴⁴ Some states, to eliminate possible antagonism toward the use of speed measuring devices, and less importantly to avoid the issue of entrapment, have enacted statutes making "speed traps" illegal¹⁴⁵ and governing the use of radar for traffic

control.¹⁴⁶ The role of radar in states with speed trap laws has not been adequately determined.¹⁴⁷ However, warning signs, uniformed police, and marked cars have all been held to rebut the claim of a "trap."

The theory that police must always say in effect, "We are about to check your speed," has been accepted by most law enforcement agencies¹⁴⁸ even where not required by statute. But in some jurisdictions the law specifies that signs must be posted. In Ohio, for example, the statute specifically states that a sign reading SPEED METER AHEAD must be erected not less than 750 feet and not more than 1500 feet along the road from where vehicles will be checked. In Pennsylvania, "official warning signs" must be present before evidence of speeding by use of radar will be admitted.¹⁴⁹

In jurisdictions where the legislature has thus acted, the motorist may well have a valid objection to the introduction of speed test results if the commands of the statutes have not been followed. However, in the absence of such statutes it is clear that the courts have not accepted the defense of entrapment.¹⁵⁰ One reason, as noted above, is that in most places where the speed measuring instruments are in use, signs warning the motorist of their presence are erected. In addition, the courts may be recognizing the usefulness of speed traps to eliminate crime on the highways. By creating a high probability of apprehension, the motorist may become more considerate of others where he would otherwise not be.

J. CRIM. L. C. & P.S. 132 (1945), where the legal theory behind this type of legislation is said to be that the use of the highways is a privilege and that reasonable conditions may be enacted to attach to that granted privilege. See also Weinstein, *Statute Compelling Submission to a Chemical Test for Intoxication*, 46 J. CRIM. L. C. & P.S. 541 (1955), where the legal theory is stated as being the state's use of its inherent police power to limit privileges or just to promote the public safety.

¹⁴⁰ *Idaho*: State v. Bock, 80 Idaho 296, 328 P.2d 1065 (1958); *Kansas*: State Hwy. Com'n. Motor Vehicle Dept., 187 Kan. 566, 358 P.2d 765 (1961); *Nebraska*: Prucha v. Dept. of Motor Vehicles, 172 Neb. 415, 110 N.W.2d 175 (1961); *Virginia*: Walton v. City of Roanoke, 204 Va. 678, 133 S.E.2d 315 (1963).

¹⁴¹ 384 U.S. 751, 768 (1966).

¹⁴² See discussion DONIGAN, *supra* n.4 at 185-187, on effect of these statutes on admissibility of chemical test evidence.

¹⁴³ Woodbridge, *Radar in the Courts*, 40 VA. L. REV. 809, 810 (1954).

¹⁴⁴ 1 ALEXANDER, LAW OF ARREST §316 at 1045 (1949).

¹⁴⁵ *E.g.*, California, Oregon, and Washington. See Fleming v. Superior Court, 196 Cal. 344, 238 P. 88 (1925) where the constitutionality of the statute upheld on the ground that the legislature may well have thought that actively patrolling the roads was the best method of preventing illegal speeding, and that prevention of crime is far better than apprehension after a preventable crime has taken place.

¹⁴⁶ *E.g.*, Maryland, Ohio, Pennsylvania, and Virginia.

¹⁴⁷ See *In Re Beamer*, 133 Cal.App.2d 63, 283 P.2d 356 (1955) where speed trap law was held not to be violated by the use of evidence secured by a radar speedmeter. Note also that according to a statement in 43 CALIF. L. REV. 710, 713 (1955), an unpublished case in Oregon held that the use of the radar speedmeter did not violate the speed trap law (*Salem v. Franz*, June 22, 1954). *Accord*, State v. Ryan, 48 Wash.2d 304, 293 P.2d 399 (1956).

¹⁴⁸ A survey taken shows that 86% of the respondents used permanent type warning signs.

¹⁴⁹ See *Commonwealth v. Fornwalt*, 203 Pa.Super. 411, 202 A.2d 115 (1964) where the statute was held not to require use of exact language "radar is in operation" and does not require erection of specific sign at time and place where police are using radar to apprehend speeders, signs with words "radar enforced" were held sufficient. *But see Commonwealth v. Brose*, 412 Pa. 276, 194 A.2d 322 (1963) where conviction reversed by state's failure to prove existence of any signs on road.

¹⁵⁰ Note that the defense of entrapment is not a constitutional requirement.

Another possible defense entails arguing the necessity of legislation to authorize the use of radar. A defendant may attempt to show the court that until radar devices are given legislative approval, they constitute hearsay because the radar is in effect an out of court declaration.¹⁵¹ Some states, to avoid this question, have passed statutes authorizing the use of the radar speedometer,¹⁵² and providing that the result shall constitute *prima facie* evidence of speeding, "upon proof that the machine used for measuring speed had been properly set up and recently tested for accuracy."¹⁵³ However, the radar device has been judicially proven to be a reliable outside source and, thus, fits into the trustworthiness exception previously discussed.¹⁵⁴

One difficulty in practical application of the radar devices is the picking out of the speeding car from heavy traffic. The defendant may claim the officer picked out the wrong car, thus invalidating the radar evidence in his case. "The most effective rebuttal to this argument is the testimony of a well-trained, intelligent, capable enforcement officer, and one of unquestioned integrity."¹⁵⁵ Moreover, courts allow

great latitude in establishing the identity of one accused of crime. It may be done by direct or indirect or circumstantial evidence. It may be done by oral or demonstrative evidence. . . . The proof of identity . . . need not be made positively or in a manner free of any inconsistencies; as no class of testimony is more uncertain than that relating to identity. . . .¹⁵⁶

One other possible defense to the admission of

¹⁵¹ This point is not well taken considering the value of other types of scientific evidence in court, such as x-rays, blood tests, and fingerprinting, without requiring statutory authorization.

¹⁵² Equivalent to judicial notice of the scientific reliability of the radar speedometer.

¹⁵³ See *Royal v. Commonwealth*, 198 Va. 883, 96 S.E.2d 812, 816 (1957). Constitutionality of statute upheld in *Dooley v. Commonwealth*, 198 Va. 32, 92 S.E.2d 348 (1956).

¹⁵⁴ Text at n.84-85, *supra*.

¹⁵⁵ 11 AM. JUR. PROOF OF FACTS, SPEED, SUPP. at 17 (1966). See *Commonwealth v. Bartley*, 411 Pa. 286, 191 A.2d 673 (1963) where police officer's testimony that he knew exact spot radar beam first picked up objects, and that he saw defendant's vehicle approach spot, was held sufficient to rebut contention that since defendant's vehicle was one of five in a line, the officer could not be certain which vehicle was in violation of the speed ordinance.

¹⁵⁶ 1 ALEXANDER, *supra* n.144 at §246 at 799. See also *People v. Sarver*, 205 Misc. 523, 129 N.Y.S.2d 9 (1954).

radar evidence relates to the arrest itself in jurisdictions where an officer is forbidden to make an arrest without a warrant unless the offense is committed "in his presence".¹⁵⁷ The problem arises where the arresting officer in the "pickup car" is relying solely on the radio message of his partner, and not on his own knowledge.¹⁵⁸ This problem has never been resolved in a reported case.

The final area of discussion of scientific evidence in traffic cases assumes admissibility. The question then becomes what weight is to be accorded this evidence in deciding the case. Is it merely presumptive evidence of guilt rebuttable by the defense, or is it, in practical effect, conclusive?

Considering first the chemical tests, it must be noted that several states have statutes sanctioning the use of the chemical tests, and establishing their results as presumptive evidence. Most states have simply incorporated the standard set by the Uniform Vehicle Code.¹⁵⁹ However, some states give *prima facie* effect to the results which "sets up a permissive presumption of fact, rather than directing a presumption of law" as recommended in the Uniform Vehicle Code.¹⁶⁰ In either case, it is important to remember that none of the results are conclusive;¹⁶¹ that it is always open to the motorist to bring in countervailing evidence of his sobriety. It is for this reason that law enforcement agencies, in making arrests for drunken driving, follow a well planned procedure aimed at recording all relevant information concerning the defendant's conduct at the time of arrest. The observation of clinical symptoms of drunkenness may often weigh as heavily as the percentage of alcoholic concentration in the blood.

The types of countervailing evidence the defendant may also involve the practical problems of chemical testing. One such problem occurs when

¹⁵⁷ TENNESSEE CODE §11536 (1954) discussed in 23 TENN. L. REV. 784, 795 (1954).

¹⁵⁸ See VIRGINIA CODE §46-215.2(b) (1954) discussed in 40 VA. L. REV. 809, 810 (1954) in which the arrest is permitted by the "officer who received a radio message from the officer who observed the speed of the motor vehicle." See also 1 ALEXANDER, *supra* n.144 at §76 which suggests that such an arrest is "in the presence of" the arresting officer. *Id.* at 431: "Personal presence includes corporeal extension within the sphere of sense perception. . . . Presence is not the same as view."

¹⁵⁹ See n.36.

¹⁶⁰ DONIGAN, *supra* n.4 at 26.

¹⁶¹ See to this effect: *State v. Roberts*, 102 N.H. 414, 158 A.2d 458 (1960); *People v. Miller*, 357 Mich. 400, 98 N.W.2d 524 (1959); *Toms v. State*, 95 Okla.Cr. 60, 239 P.2d 812 (1952); *Halloway v. State*, 146 Tex.Cr.R. 353, 175 S.W.2d 258 (1943).

there is a time lapse between arrest and subsequent testing. Since the percentage of blood alcohol concentration in the blood at the time of arrest in this case must be estimated, the motorist may want to attack the validity of the "extrapolation" process employed. Though most cases have admitted experts' estimates by extrapolation,¹⁶² the probative weight of the test result is lessened by proof of a considerable time lapse.

Another problem is the great variance among individuals. For example, each individual has a different rate of elimination of blood alcohol. The estimate by extrapolation, used in time lapse cases, may be attacked on the ground that it is applicable to the average person in normal physical condition. "The person whose sobriety is in issue may not be an average person,"¹⁶³ and the weight of the presumption of intoxication suffers accordingly.

The individual variance problem also arises in connection with the percentage of alcoholic concentration in the blood. The impairment percentage established by science, and accepted by most courts, is based on an average individual. Proof that the defendant is not an average person with regard to alcoholic consumption might tip the balance in his favor. An example of such proof would be a showing that at the time of arrest, the defendant's speech was clear, his clothes neat, behavior proper, and that he was generally co-operative and not argumentative.¹⁶⁴ Such evidence may also weigh heavily against the prosecution's "probable cause" requirement for compelling a blood test under the Fourth Amendment.¹⁶⁵

The weight to be accorded chemical test results is also limited by the fact that a prosecution for driving while under the influence of intoxicating liquor falls into the amorphous category of a quasi-criminal proceeding. Guilt must be proved beyond a reasonable doubt.¹⁶⁶ The "presumption

¹⁶² See *State v. Stairs*, 143 Me. 245, 60 A.2d 141 (1948) where elapsed time was four hours, and estimate admitted. See also *Ray v. State*, 233 Ind. 495, 120 N.E.2d 176 (1954); *People v. Holmes*, 2 Mich.App. 283, 139 N.W.2d 771 (1966); *People v. Taylor*, 152 Cal.App.2d 29, 312 P.2d 731 (1957). For more complete list see DONIGAN, *supra* n.4 at 46.

¹⁶³ DONIGAN, *supra* n.4 at 46.

¹⁶⁴ *State v. Joas*, 34 N.J. 179, 168 A.2d 27 (1961). Conversely, though, the prosecution may contend that even though the blood alcohol concentration is below the 0.10% (the presumptive level of "under the influence" intoxicants in the Uniform Vehicle Code) additional evidence may lead to the conclusion that this person's driving ability was impaired.

¹⁶⁵ See text at n.132-33, *supra*.

¹⁶⁶ *State v. Emery*, 27 N.J. 348, 142 A.2d 874 (1958).

of innocence"¹⁶⁷ therefore will resolve all doubtful questions of identity of the specimen, and accuracy and reliability of the test results, in the favor of the defendant.

"However, as the validity and value of chemical tests become better known generally, there is a noticeable trend on the part of some of our courts to give more weight to chemical test evidence and its probative force in establishing definite impairment on the part of a motorist."¹⁶⁸ Typical of this trend is the opinion of the Supreme Court of New Jersey in a case already alluded to:

[t]he magistrate here, despite his finding that the drunkometer test was properly administered, said that he did not find the reading sufficient, standing alone, to prove guilt beyond a reasonable doubt. We have difficulty understanding this conclusion in the light of what we have already said. The judge may have thought corroboration to be necessary to maintain the strength of the presumption. Such a view would not be correct.¹⁶⁹

Though human variances and personnel mistakes presently cause us to withhold conclusive weight to such evidence,

it may, of course, well be that in the none too distant future experimentation along such lines will be sufficiently advanced so that specimens of blood which are found to contain certain percentages of alcohol may be almost conclusive on the question of intoxication in cases where the samples have been properly taken, accurately analyzed by competent chemists. . . .¹⁷⁰

Radar speedometer results have been accorded more conclusive effect in court than chemical tests. The reasons are two-fold. First, the radar speedometer has been held by many courts to be a proper subject for judicial notice.¹⁷¹ Secondly, the individual variance problem encountered in the chemical test cases is inapplicable here. Furthermore, the radar speedometer has been reluc-

¹⁶⁷ See Gillies, *Presumption of Innocence, Its Applicability to Prosecutions For Speeding Violations*, 47 J. Crim. L.C. & P.S. 64 (1958).

¹⁶⁸ DONIGAN, *supra* n.4 at 31.

¹⁶⁹ *State v. Johnson*, 42 N.J. 146, 170, 199 A.2d 809, 824 (1964).

¹⁷⁰ *Kuroske v. Aetna Life Ins. Co.*, 234 Wis. 394, 291 N.W. 384 (1940).

¹⁷¹ See n.66, *supra*.